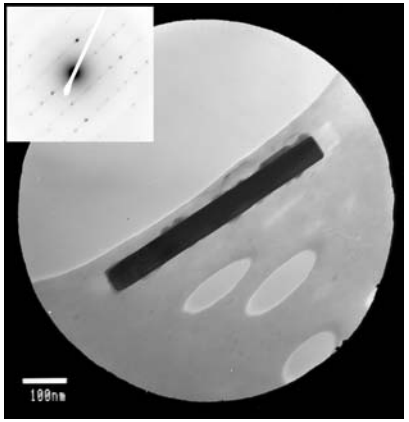
DMR-9876164 CAREER: Homogeneous Solution Phase Synthesis of Nanoscale Materials

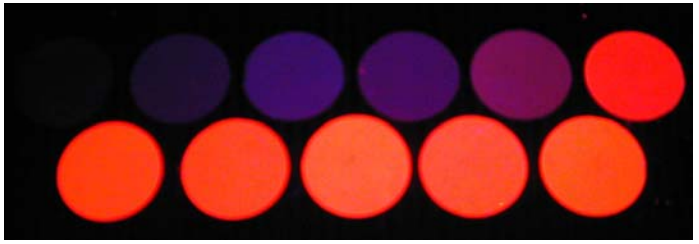
Michael J. Wagner, George Washington University

Realizing the promises of nanotechnology will require methods to synthesize a wide variety of functional nanomaterials. The PI is exploring a novel method of making nanomaterials, one that is uniquely applicable across the periodic table. Some examples of materials synthesized within the scope of this project are:

- Perovskite Nanorods
  - Ferroelectrics for nanoelectronics
- High Surface Area Transition Metal Carbides
  - Catalysts to replace noble metals & high strength nanostructured ceramics
- Lanthanide Metal and Alloy Nanoparticles
  - Nanoparticles for magnetic applications
- Nanocrystalline Phosphors
  - Low voltage FED Flat panel display technology



Single crystal $NaTaO_3$ nanorod



Y_2O_3:Eu nanocrystals showing size dependent fluorescence

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Education

•Five undergraduates (Ed Brant, Karl Bezak, David Penneys, Brian Laliberte, Bhoomi Bhrambrat) and seven graduate students (Alejandra Echezuria, Jen Nelson, Kim Mooney, Mike Harrell, Rob Doe, Olivera Zivkovic and Amal Bassa) have participated in this project.

•The PI has been active in mentoring undergraduates as the chapter advisor for GW's Alpha Pi chapter of the Chemistry Fraternity, AXE.

•The PI has introduced Materials Chemistry to Undergraduates through an advanced course he developed and integration of materials topics into other courses he teaches.

Chemistry Outreach to DC Public Schools

With GW's AXE chapter, the PI has helped organize and participated in an outreach program, based on ACS's "Kids and Chemistry", partnering with local schools for yearly visits.

Professor Wagner helping young scientists explore chemistry.